

Notice of Allowability	Application No.	Applicant(s)	
	10/001,977	TANIMOTO ET AL.	
	Examiner	Art Unit	
	Pamela E Perkins	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment received on 20 February 2004.
2. ☒ The allowed claim(s) is/are 1-3 and 5-16.
3. ☒ The drawings filed on 05 December 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>2/11/04</u>. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|--|---|


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

This office action is in response to the filing of the request for reconsideration received on 20 February 2004. Claims 1-3 and 5-22 are pending; claims 17-22 have been withdrawn from consideration.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Cancel claims 17-22.

Allowable Subject Matter

Claims 1-3 and 5-16 are allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: prior art does not anticipate, teach, or suggest a method of manufacturing a semiconductor device, where a semiconductor element is formed in a semiconductor active region the semiconductor active region being in an electrically floating state, calculating a generation rate of electron hole pairs caused by impact ionization in said semiconductor

element; calculating a volume integral of said generation rate of electron hole pairs in an area where the impact ionization is caused; evaluating time-dependent variations of electrical characteristics of said semiconductor element on the basis of said volume integral; and manufacturing a semiconductor device based on results of the evaluating step.

Agarwal et al. (5,510,630) disclose a method of manufacturing a semiconductor device where a semiconductor element is formed in a semiconductor active region and calculating the generation rate of electron hole and a time integral of physical quantities. Agarwal et al. further disclose manufacturing a semiconductor device on the basis of the results. However, Agarwal et al. do not disclose, anticipate, teach, or suggest calculating a volume integral of the generation rate of electron hole pairs in an area where the impact ionization is caused and evaluating time-dependent variations of electrical characteristics of the semiconductor element on the basis of the volume integral and manufacturing a semiconductor device based on results of the evaluating step.

Huth (5,021,854) discloses a method of manufacturing a semiconductor device where a semiconductor element is formed in a semiconductor active region, calculating the generation rate of electron hole pairs caused by impact ionization and evaluating time-dependent variations of electrical characteristics of the semiconductor element (col. 1, lines 8-38; col. 9, lines 37-55). However, Huth does not disclose, anticipate, teach or suggest the semiconductor active region being in an electrically floating state; calculating a volume integral of said generation rate of electron hole pairs in an area

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where the impact ionization is caused; evaluating time-dependent variations of electrical characteristics of said semiconductor element on the basis of said volume integral; and manufacturing a semiconductor device based on results of the evaluating step.

The prior art made of record in this action does not anticipate, teach, or suggest a method of manufacturing a semiconductor device, where a semiconductor element is formed in a semiconductor active region the semiconductor active region being in an electrically floating state, calculating a generation rate of electron hole pairs caused by impact ionization in said semiconductor element; calculating a volume integral of said generation rate of electron hole pairs in an area where the impact ionization is caused; evaluating time-dependent variations of electrical characteristics of said semiconductor element on the basis of said volume integral; and manufacturing a semiconductor device based on results of the evaluating step.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E Perkins whose telephone number is (571) 272-1840. The examiner can normally be reached on Monday thru Friday, 9:00am to 5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PEP


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